CLAIMS

1. An apparatus for checking the position of a mechanical part, more particularly a free end of an elongate tool **(3)**, including

- a frame **(5)**, stationary with respect to the mechanical part to be checked,
- a base **(6)** carrying a mechanical support **(25)**, the base **(6)** and the frame **(5)** being mutually movable along a longitudinal feed direction **(X)**,
- an emitter **(20)** for generating a light beam **(21)** along a trajectory transversal with respect to the longitudinal feed direction **(X)**, and a sensor **(22)**, arranged along the trajectory of the light beam **(21)**, the emitter **(20)** and the sensor **(22)** being coupled to the mechanical support **(25)** in mutually defined positions, the sensor **(22)** being adapted for providing signals indicative of the reception of the light beam **(21)**,
- a transducer device **(9,10)** for checking the mutual position between the base **(6)** and the frame **(5)**, and
- a processing, display and control unit **(12)**, connected to the sensor **(22)** and to the transducer device **(9,10)** for processing said signals of the sensor **(22)** and for identifying the mutual position between the base **(6)** and the frame **(5)** at the interruption of the light beam **(21)**,

characterized in that the apparatus includes a coupling mechanism **(24)** between the mechanical support **(25)** and the base **(6)** adapted for enabling oscillations of the light beam **(21)** with respect to the base **(6)** substantially along a transversal reference surface,

the apparatus further including an activation device **(26)** and transmission elements **(29,30)** adapted for controlling said oscillations of the light beam **(21)** with respect to the base **(6)**.

2. The apparatus according to claim 1, wherein the coupling mechanism **(24)** and the transmission elements **(29,30)** enable oscillations of the light beam **(21)** in a delimited area **(33)** of said reference surface.

3. The apparatus according to one of the preceding claims, wherein the longitudinal feed direction **(X)** is substantially perpendicular to the reference surface.

4. The apparatus according to one of the preceding claims, wherein said reference surface is substantially plane.

5. The apparatus according to one of the preceding claims, wherein said coupling mechanism includes fulcrum devices **(24)** coupled to the mechanical support **(25)** and to the base **(6)**.

6. The apparatus according to claim 5, wherein said fulcrum devices **(24)** define an axis of oscillation that is substantially parallel with respect to the longitudinal feed direction **(X)**.

7. The apparatus according to claim 6, wherein the fulcrum devices **(24)** are coupled to the mechanical support **(25)** in such a way that said axis of oscillation is substantially perpendicular to and substantially coplanar with the trajectory of the light beam **(21)**.

8. The apparatus according to claim 7, wherein the activation device includes a motor **(26)** with a spindle **(28)** with an axis of rotation that is substantially parallel with respect to the longitudinal feed direction **(X)**, said transmission elements include a connecting rod **(30)** coupled at one end to the mechanical support **(25)** and at the other end to the spindle **(28)** of the motor **(26)**, in an eccentric position with respect to the axis of rotation.

9. The apparatus according to one of the preceding claims, wherein the light beam **(21)** has transversal dimensions that do not exceed 2 mm.

10. The apparatus according to one of the preceding claims, wherein the light beam **(21)** is a laser beam.

11. A method for checking an elongate tool **(3)**, that is substantially arranged along a longitudinal direction **(X)** and includes a free end, by means of an apparatus **(1)** including an emitter **(20)** for generating a light beam **(21)** along a transversal trajectory and a sensor **(22)** for detecting the interruption of the light beam **(21)**, a base **(6)**, movable along the longitudinal direction **(X)** with respect to the tool **(3)** to be checked, that carries, by means of a coupling mechanism **(24)**, said emitter **(20)** and said sensor **(22)**, and a transducer device **(9,10)** for checking the mutual position between the base **(6)** and the tool **(3)** to be checked, the method including
a mutual feed displacement along the longitudinal direction **(X)** between the movable base **(6)** and the tool **(3)** to be checked for causing the approach of the light beam **(21)** towards the free end of the tool **(3)**, and
a detection of the interruption of the light beam **(21)** in the course of this displacement,
the method is characterized in that the oscillations of the light beam **(21)** with respect to the base **(6)** occur substantially along a transversal reference surface and concurrently with the mutual feed displacement, the oscillations being enabled by the coupling mechanism **(24)** and being controlled by an activation device **(26)**.

12. The method according to claim 11, wherein said oscillations of the light beam **(21)** have preset frequency, said preset frequency and the speed of the mutual feed displacement along the longitudinal direction **(X)** between

the movable base **(6)** and the tool **(3)** are such that the initial interference between the free end of the tool **(3)** and said transversal reference surface causes the interruption of the light beam **(21)**.

13. The method according to claim 12, wherein said preset frequency is not less than 10 Hz.

14. The method according to one of the claims 11 to 13, wherein the longitudinal direction **(X)** is substantially perpendicular to the transversal reference surface.

15. The method according to claim 14, wherein said oscillations occur about a longitudinal axis that is substantially perpendicular to the trajectory of the light beam **(21)** and coplanar with it.

16. The method according to one of the claims 11 to 15, further including
an additional mutual displacement along the longitudinal direction **(X)** between the movable base **(6)** and the tool **(3)** to be checked opposite with respect to said mutual feed displacement, in order to cause the displacement of the light beam **(21)** away from the tool **(3)**,
a second feed displacement at the end of said additional displacement, said oscillations of the light beam **(21)** with respect to the base **(6)** also occurring in the course of said second feed displacement, and
a second detection of the interruption of the light beam **(21)** during this second feed displacement,
wherein said second feed displacement has a slower speed **($V_2$)** with respect to the speed **($V_1$)** of said mutual feed displacement.

17. The method according to one of the claims from 11 to 15, further including
an additional mutual displacement along the longitudinal

direction **(X)** between the movable base **(6)** and the tool **(3)** to be checked opposite with respect to said mutual feed displacement, in order to cause the displacement of the light beam **(21)** away from the tool **(3)**, said oscillations of the light beam **(21)** with respect to the base **(6)** also occurring in the course of said additional mutual displacement, and

an additional detection of the ceasing of the interruption of the light beam **(21)** during said additional mutual displacement,

wherein said additional mutual displacement has a slower speed **($V_2$)** with respect to the speed **($V_1$)** of said mutual feed displacement.